Ayres (Dan'l)

NEW SURGICAL TREATMENT

FOR

MALFORMATIONS

OF THE

URINARY BLADDER,

BY

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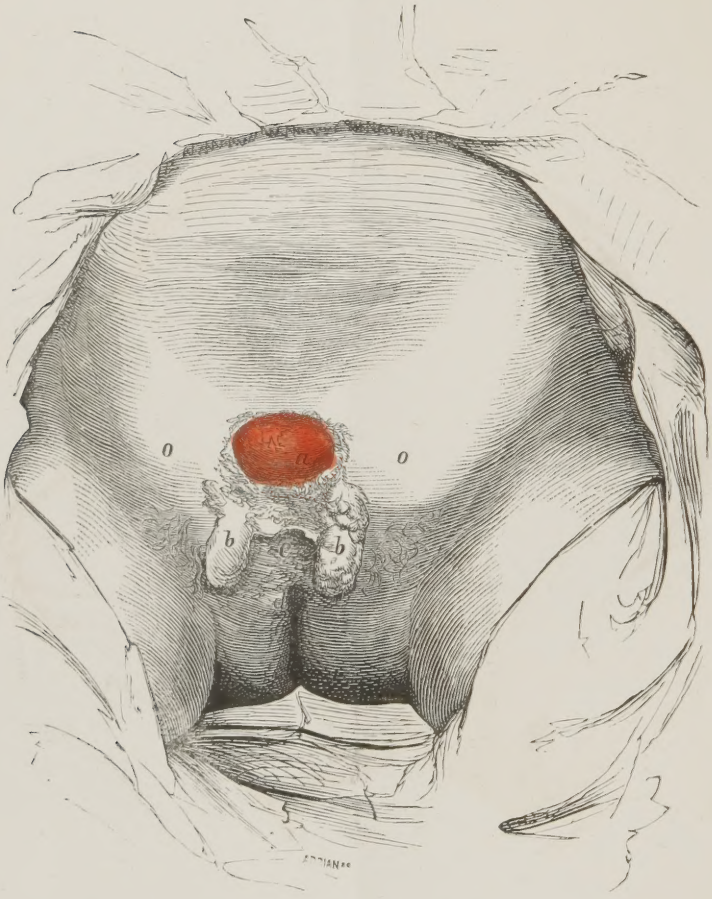
DR. AYRES' CASE OF EXSTROPHY OR MALFORMATION OF THE BLADDER, BEFORE OPERATION.

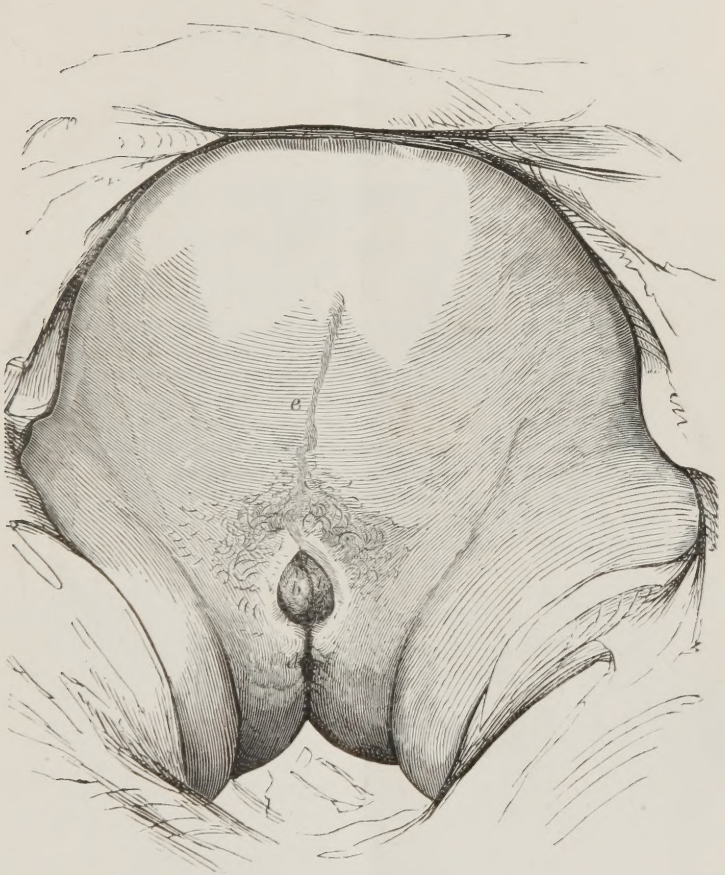
FIG. 1.



a, BLADDER EXPOSED FORMING A BRIGHT VERMILION TUMOR.
b, *b*, NYMPHÆ OR LABIA MINORA. *o*, *o*, LABIA MAJORA. *c*, VAGINA.
d, ANUS.

DR. AYRES' CASE OF EXSTROPHY OR MALFORMATION OF THE BLADDER, AFTER OPERATION.

FIG. 2.



e, LINEAR CICATRIX FORMED BY THE FLAPS COVERING THE BLADDER.
b, *b*, NYMPHÆ BROUGHT TOGETHER, AND ENCLOSED BY THE VULVA.

CONGENITAL EXSTROPHY

OF THE

URINARY BLADDER,

AND ITS COMPLICATIONS,

SUCCESSFULLY TREATED BY A NEW PLASTIC OPERATION.

(Illustrated.)

BY

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EXSTROPHY

OF THE

URINARY BLADDER.

Exstrophy, or extroversion of the urinary bladder, is a congenital malformation, which Prof. Gross, in his excellent work on the Urinary Organs, says "amounts to a hideous monstrosity."

Such cases are, comparatively, seldom met with, except in large cities, to which they resort for pecuniary assistance. Excluded as they are from the avenues of honest industry by a condition at once disgusting and repulsive, they are (unless born in affluence) literally outcasts from society, and may occasionally be found eking out a precarious subsistence by exhibiting themselves as surgical curiosities to the classes of our various medical schools.

Little is to be found on this subject in systematic works of surgery; but excellent descriptive monographs have been contributed by different countries. Among them will be found that of Dr. Monro, contained in Vol. I. of the Edinburgh Medical and Surgical Journal. In France, Thiebault has contributed some cases; and an article by Breschet will be found in the Dic. des Med. Sciences, tome xiv.

Von Ammon has recorded instances in his "Congenital Diseases of Man," vol. 1, p. 14; and Heyfelder has furnished a paper on the subject to the transactions of the Royal Leopoldinean Academy of Natural Philosophers.

In the London Medical Gazette for 1845, Prof. Errichsen details a series of highly interesting experiments on the elimination of different substances by the kidneys, in a person under his inspection with this deformity.

Other cases have been noted in various professional journals from time to time. The general type to be observed in all the instances which have been described is much the same; shades of difference and peculiarities of sex constituting the chief points of variety.

The essential characteristic of these malformations consists in a deficiency or absence of the symphesis and bodies of the pubis. The osseous keystone of the pelvic arch in front, which is the natural point of insertion for the abdominal parietes, being absent, the pelvic bones terminate abruptly on either side, leaving a hiatus varying from two to five inches in width. The recti, and other abdominal muscles necessarily inclining off, to be inserted at these abutments, removes all anterior support from the viscera situated in this region. The bladder is consequently pressed forward during the early period of fœtal life, to occupy the vacant space, and becomes fused with the integuments at that point where the placental vessels traverse the abdominal walls.

But it may be pertinently asked, What is the *initial* cause of this failure of ossific union at the pubis? It is scarcely an answer to such a question to call it "an arrest of nutrition," for we naturally seek to know the *cause* of such "an arrest."

It has been noticed that the umbilicus is uniformly absent in all these cases, proving that the mechanism of the maternal and fœtal union is intimately connected with, if it does not determine this malformation.

An instance occurred in the practice of Dr. McPhail, of this city, in which the urachus was continued several inches into the umbilical

cord, and was therefore included very naturally within the ligature applied at the usual point of deligation. A fatal peritonitis was the result, and a post-mortem examination revealed the fact. Now, may not such an occasional prolongation of the urachus into the cord be looked upon as an intermediate form of development, which, when aggravated, may determine the difficulty in question, acting in this position as a foreign body to prevent the osseous union and consolidation of the pubic arch? Such an explanation of the rationale of this species of deformity certainly requires no inordinate stretch of the imagination, and may be worthy of attention in the absence of any more plausible hypothesis.

The absence of a bony support is partially supplied by fibro-cellular tissue between the abutments, whilst above there is probably an expansion of the aponeurosis of the external oblique, conjoined tendons, fascia transversalis, and peritoneum, all of which are firmly attached around the base of the posterior wall of the bladder, which is here gathered into an oblong, oval body varying in size, from a filbert to a large fist. This tumor is found to become larger when the patient is standing, and smaller when the recumbent position is assumed. It exhibits a deep vermilion color; is exquisitely sensitive to the touch; bleeding upon very slight irritation, and surrounded by integument which near its base resembles mucous membrane. In elderly subjects it is said that the surface of this tumor is sometimes changed, becoming invested with a kind of cuticle, whilst its sensibility is greatly diminished. On close inspection, the mouths of the ureters will be detected emerging from the inferior portion of the tumor near its base, from which urine constantly dribbles, unless the parts are irritated or pressed upon, when it is discharged per saltum. This constant wetting of the parts is not productive of so much irritation or excoriation as might be anticipated, provided tolerable attention is paid to cleanliness, and the parts are not subjected to much friction; for it seems that the renal secretion exhibits less acrimony when immediately extruded from the kidneys, and is consequently indebted for much of this quality to its retention in the bladder, where probably some of its watery

constituents are reabsorbed, and the remainder becomes subject to chemical changes.

It will be observed that the integuments which are here usually covered with hair, are, as it were, split, whilst on both sides the hair is found growing luxuriantly in lines curving outwards towards the iliac spines.

It has been remarked, that the greatest variations among these cases arise from the imperfect development, malposition, or entire absence of different portions of the genital organs; and the amount of venereal desire seems to be in proportion to their perfection. In the male, a rudimentary penis and urethra are generally discovered below the cystic tumor, and the testicles, if present, are in an equally undeveloped condition.

In the female, the genital organs are also occasionally very imperfectly formed. The clitoris is most frequently absent, or not to be detected, and, as we might expect, there is seldom any trace of a urethra. In other respects, the organs may be normal; the uterus, ovaries, and vagina being perfect, and the subject capable of procreation, as was shown in one of the cases related by Thiebault, and noted as a very interesting and remarkable fact. Similar capacities existed in the subject of the present memoir, and a hope of mitigating the deplorable results of parturition first prompted an extension of surgical art to the melioration of a hitherto intractable deformity.

The patient (whose name is omitted by special request) was admitted to the Long Island College Hospital November 1st, 1858, and a history of the case recorded by the House Surgeon, Dr. Ostrander.

She is 28 years of age, born of healthy parents, both of whom were free from deformity; her height is below the average of females, and she is unmarried. She declares her health to have always been good, appetite and digestion excellent, bowels regular, and the catamenia in all respects normal.

She states that, on the 5th of July preceding, she was delivered of

a well-developed child, having carried it to maturity without extraordinary difficulty.

Labor commenced with free hæmorrhage, (footling presentation,) and lasted two hours, at the end of which time the child was born, having died in process of delivery. Perineum uninjured.

She reports having made a tolerable recovery, though for a long time weak, and her present appearance is somewhat anæmic.

Shortly after she began walking about, symptoms of prolapsus uteri came on, becoming gradually worse, until the organ projected external to the vulva, attended with dorsal, dragging pain, difficulty of locomotion, and gastric disturbance.

In quest of relief, she entered the Brooklyn City Hospital on the 1st of September following her confinement, and remained there one month. Here she states that a variety of pessaries were tried, none of which could be retained, and finally a surgical operation was performed, the nature and character of which is not very apparent.*

Finally, a species of stem-pessary was contrived, which was intended to support the uterus, whilst kept in position by strings passed around the thighs. This, however, proved very inefficient—the uterus slipping by the instrument upon the slightest extra exertion. Moreover, the parts had now assumed an irritable condition, partly due to increased friction of the apparatus, and undue attention to cleanliness,

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* Since the above was in press, a short article, descriptive of this case, has appeared in the *Virginia Medical Journal* for January, 1859, written by the House Surgeon of that Institution. The writer states, that an attempt was made to retain the prolapsed uterus "by removing an inch of mucous membrane from the bottom and sides of the vulva, and uniting them by two figure of 8 sutures, which were removed on the sixth day, when no adhesion was found to have taken place." The writer continues: "The patient was allowed to get up on the fourteenth day, when the prolapsus was found to exist nearly as much as before," &c.

It is obvious that no effort was made to relieve the congenital deformity, and that she was discharged in much the same condition as when she entered.

added to the causes already noted; altogether, her deplorable condition was scarcely susceptible of being made worse.

I may here remark, that the figures, both before and after the operation, have been photographed from accurate plaster casts, taken directly from the patient—a very difficult and delicate procedure, for which I am much indebted to the skill and kindness of my colleague, Dr. Bauer, and our valuable assistant, Mr. J. F. Esslinger.

Fig. 1, is an exact representation of the parts at the time of presentation to the clinical class of the Long Island College Hospital, for the purpose of critical examination. The prolapsus having been carefully and completely reduced, was found to retain its place so long as the patient maintained the recumbent position.

The distance between pubic abutments was estimated at about three inches.

The bladder (*a*) forming an oval, elliptical tumor, mammillated upon the surface, which in the recumbent position measured two inches in its long, and one and a quarter inches in its short diameter. This was soft, elastic, of bright vermilion color, and covered with a thick tenacious mucus; bleeding readily when rudely handled, and so exquisitely sensitive, that whilst under the full influence of chloroform, and insensible to the knife, a sponge passed over the exposed bladder excited reflex motions.

The integuments immediately surrounding the bladder were found red and puckered, but very soft, delicate, and free from hair between the bladder and point of sternum. The labia majora (*o. o.*), thick, fleshy, and luxuriantly covered with hair, were gathered into folds swelling away towards either thigh; these were carefully shaved previous to taking the cast and performing the operation.

The nymphæ occupied isolated positions on each side of the vulva, and are designated in all the figures by the letters *b. b.*

Between these and the vagina below no trace of clitoris or urethra

could be distinguished, but the whole surface was covered with mucous membrane, continuous with the vaginal lining.

Here, then, we had to contend with two formidable difficulties, either of which was a problem in itself, viz., aggravated prolapsus from an entire absence of anterior support, added to the original congenital malformation.

To form an estimate of the value attached to surgical operations in these cases, we cannot do better than quote the opinion of Prof. Erichsen, of University College, London. Having collected the experience of the profession on this topic, his eminent position at the centre of surgical science, added to his well known and extensively recognized erudition, renders him at once a reliable and compendious authority on the subject.

"This malformation," says he, "is incurable. Operations have been planned, and performed with a view of closing in the exposed bladder by plastic procedures, but they have *never* proved successful, and have terminated in some instances in the patient's death; they do not, therefore, afford much encouragement for repetition."

So unsatisfactory have been the results of these operations, that the profession has not been favored with their general plan, their details, nor the causes of failure. It must be evident, however, that operations based upon the principles of plastic surgery alone offer prospects of success.

The most probable source of failure, and one which challenged our early attention, was the disastrous result to be apprehended from urinary infiltration, which, by its irritating character, would necessarily destroy all prospect of union, if it did not induce extensive sloughing of the abdominal parietes: peritonitis and purulent phlebitis are likewise probable sources of danger, unless carefully guarded against. Indeed these may all become inevitable consequences of attempting to accomplish too much at one time; and it was therefore determined to arrange our proceedings with a special view, if possible, to avoid them. The indications which it was proposed to follow were:

1st. To form an anterior wall for the exposed bladder.

2d. To restore the urinary canal.

3d. To establish the anterior fourchette of the vulva.

4th. To supply means to prevent the prolapsus, and to collect the renal secretions.

The delicate character of the integuments above the bladder, and its well-known transmutability into the conditions of a mucous membrane, peculiarly adapted it to supply the anterior cystic wall, and thus fulfil the primary indication.

With these objects in view, the operative proceedings were divided into two stages.

The first consisted in raising a flap from the anterior portion of the abdomen, including the superficial fascia, turning its cuticular surface down over the exposed bladder as far as its inferior border, and securing the lateral union of the flap in that position, whilst a free exit below was maintained for the urinary discharge; an important result, still further assisted by the dependent situation of the outlet of the ureters already alluded to.

By these means it was proposed to accustom the highly sensitive bladder to a gradual and methodical compression, whilst the flap itself was insured ample space to undergo such swelling as might be anticipated from its new position, and the unusual stimulation of a new secretion. Time was likewise given for the necessary transmutation of tissues to make some progress.

The steps of this procedure will perhaps be better understood by a more detailed statement of the first operation, in connection with the diagramatic plates, figs. 3 and 4.

It was performed on the 16th of November last, the patient being thoroughly under the influence of chloroform, and a sugar-loaf shaped flap having been previously marked out upon the abdominal integuments; its base *c. f.*, three inches in width, was situated three-fourths

ILLUSTRATION OF DR. AYRES' PLASTIC OPERATION FOR EXSTROPHY OF THE BLADDER.

FIG. 3.

a, BLADDER. *b*, *b*, NYMPHÆ. *c*, VAGINA. *d*, ANUS.

of an inch above the cystic tumor, and extended five inches in length, with its apex towards the ensiform cartilage. The dark line *e. h. g. i. f.*, (fig. 3,) indicates its form, position, and the line of incision.

This flap being left sufficiently large to meet the elevated form of the bladder, and allow for shrinkage, was quickly but carefully separated from its cellular attachments, down to the line *e. f.*, whilst two lateral incisions, *e. j.* and *f. k.*, were continued directly downwards and towards the nymphæ, to serve as beds for receiving the sides of the new flap.

The integuments covering the lateral and inferior portions of the abdomen, extending from *g.* to *j.* on one side, and from *g.* to *k.* on the other, were now sufficiently separated from their cellular attachments to the muscles beneath to insure their sliding freely, and meeting without tension at the mesial line *g. n.*, (fig. 4.) When brought into this position they completely covered from view the raw surface of the flap already turned over, and investing the bladder, with the exception of a triangular space, *j. n. k.*, (fig. 4,) formed by the coaptation of the lateral flaps; this was temporarily covered by reflecting back upon itself the corresponding triangular free end of the deep flap, *j. e. k.*, (fig. 4,) and attaching it along the line *j. n. k.* Numerous points of interrupted suture were used to retain the parts in situ, assisted by long strips of adhesive plaster, compresses, and a retentive bandage around the body. It will be observed that the lower portion of the cystic tumor was thus temporarily left free and partially exposed, whilst no portion of cut or denuded surface remained uncovered.

The patient received a large dose of opium, and was strictly maintained in the recumbent position upon a bed, properly protected; such additional measures being adopted as would secure cleanliness.

As the parts subjected to operation began to swell, she complained of irritation and pressure upon the bladder, which, however, was promptly met with morphine alone, and subsided in the course of a few

days. Now was exhibited the great importance of leaving the tumor partially uncovered, whilst all the cut surfaces were in close contact, and thus freed from the action of irritating secretions; important facts, duly dwelt upon and recently enforced with great stress by the distinguished Prof. Syme, of Edinburgh, whose contributions to the surgical treatment of the urinary organs have alone placed both hemispheres under permanent obligation to him.

On the fourth day after the operation all sutures were removed, the wounds having healed by first intention or primary adhesion, with the exception of a spot the size of a ten cent piece, situated just above the point of the triangle, and where the deep flap had been reflected over the bladder. At this point the lateral abdominal flaps were necessarily raised up from the tissues beneath, and could not be brought into contact even by the use of compresses. This, however, granulated kindly, and was nearly cicatrized on the 7th of December, when the second and last operation was performed, as follows:

The patient, being under the influence of chloroform, the lower triangular flap *j. n. k.*, (fig. 4,) was dissected from its recent and temporary attachments, both lateral and deep, and turned down over the vulva, as indicated by the dotted line *j. c. k.*

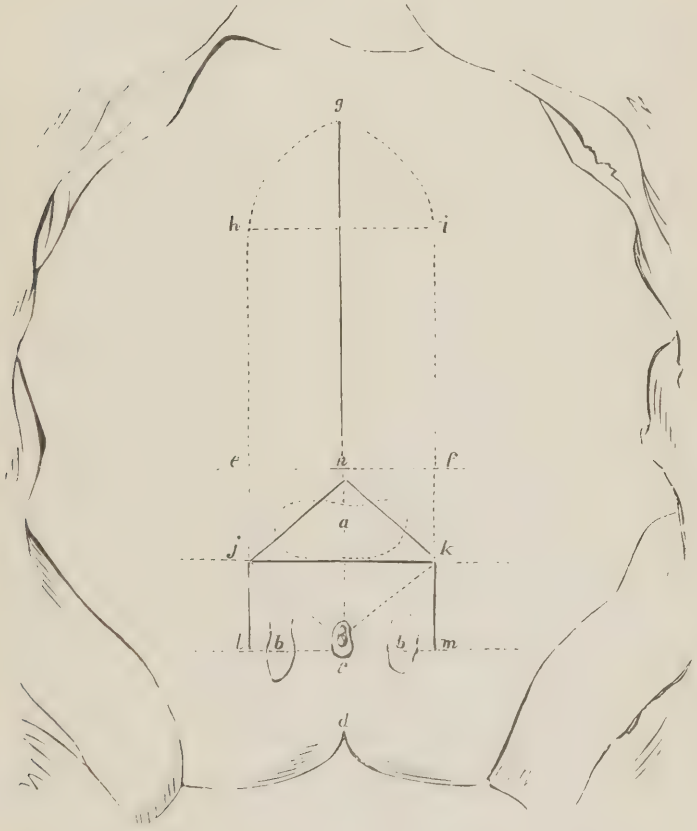
Two incisions, *j. l.* and *k. m.*, were now carried from the external angles of this triangle, perpendicularly towards and terminating just behind the nymphæ, *b. b.*

The lateral flaps bounded by the lines *n. j. l.* and *n. k. m.*, and including the labia majora, were then freely dissected from over the abutments of the pubic bones, until they could be readily slid to meet each other at the centrall ine *n. c.*, which, being a continuation of the line *g. n.*, reduced the whole to a single linear wound, occupying the "linea alba." See fig. 2.

During the operation several arterial branches bled freely, and were arrested by torsion and the free application of ice, after which the flaps were confined at the mesial line by points of interrupted

ILLUSTRATION OF DR. AYRES' PLASTIC OPERATION FOR EXSTROPHY OF THE BLADDER.

FIG. 4.



a, BLADDER COVERED BY DEEP FLAPS. *b*, *b*, NYMPHÆ. *c*, VAGINA. *d*, ANUS.

suture; the most inferior one, viz., at *l.* and *m.*, being made to include the apex *c.* of the triangular flap.

Fearing to depend on sutures alone to secure the approximated flaps, and the use of adhesive plaster being excluded by the irregularity and position of the parts, the whole surface between the points of suture was hermetically encased by strips of patent lint, soaked in collodion, and accurately applied. In addition to this, pieces of muslin were by the same method firmly attached to the labia majora, at some distance from the mesial line, and to these suture silk was fastened in such a manner as to form a lacing across and over the wound. By means of this dressing all tension was removed from the sutures, urine was totally excluded, whilst rapid and perfect adhesion soon followed.

Thus a urinary canal was formed, which would admit the little finger to be passed up one and a half inches. The anterior fourchette of the vulva was firmly established, and the mons veneris assumed its prominent and natural appearance.

The last cast of the parts representing her present condition, (fig. 2,) was taken on the 4th of January, 1859, previous to which time, the parts being all firmly united, she was permitted freely to walk about, and left the hospital to spend the holidays with her friends. No artificial support whatever was applied, in order to ascertain how far the operation would succeed in preventing the prolapsus.

After a severe test, the anterior fold of the vagina alone descended, and that for a short distance, forming a pale œdematous tumor, occupying the vulva, about the size of an English walnut. The anterior fourchette of the vulva remaining firm and resisting, a light oval pessary, made of vulcanized rubber, and perforated, was introduced into the vagina and readily retained in situ. After thorough trial, this was found to support the parts completely, and without the slightest uneasiness, even under active exertion and straining.

This was a better result than had been anticipated, inasmuch as it

was intended to rely mainly upon a disc-shaped pessary, supported by a foot attached to a simple apparatus, which we had constructed, to act as a reservoir for the urine.

January 20th.—The patient was again examined at the hospital, in the presence of a number of medical gentlemen, she having walked a distance of two miles without experiencing any inconvenience. The parts were all found sound and firm, and her general health and spirits much improved.

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